

CLAIMS

1. An electrostatic device configured and disposed to electrostatically charge and dispense a liquid composition from a supply to a point of dispense, wherein the device comprises:

an actuator;

a high voltage generator to provide a high voltage;

a power source to activate said actuator and said high voltage generator;

a reservoir to contain the supply of said liquid composition; and

a dispensing unit comprising:

a suction pump in immediate upstream relation with the reservoir for supplying the liquid composition from the reservoir, said pump being mechanically connected to said actuator to be driven thereby;

an emitter electrode to electrostatically charge the liquid composition, the emitter electrode being electrically connected to said high voltage generator; and

a nozzle to dispense the liquid composition, said nozzle being disposed at the point of dispense; and

wherein the reservoir is configured to provide a removable cartridge, said reservoir being deformable according to inner pressure.

2. The device as set forth in claim 1, wherein said reservoir is coupled to said dispensing unit and is cooperative therewith to define said removable cartridge.

3. The device as set forth in claim 1, wherein

said pump is in the form of a gear pump having a pair of gears one of which is formed with a joint for detachable driving connection with said actuator.

4. The device as set forth in claim 3, wherein
said dispensing unit comprises a pump unit shaped into a generally flat configuration,
wherein said gears are arranged within a thickness of said pump unit with respective rotation axes perpendicular to a plane of said pump unit,
said pump unit being formed with a horizontal channel which extends within the thickness of said pump unit to define an inflow path of said liquid composition from the reservoir to the gear pump as well as an outflow path from the gear pump to the nozzle.

5. The device as set forth in claim 1, wherein
said dispensing unit comprises a plug to be inserted into a fitment;
said reservoir comprises a mouth for connecting with said fitment;
wherein the reservoir and dispensing unit are in fluid communication by attaching said plug with said fitment, and said fitment with said mouth.

6. The device as set forth in claim 5, wherein
said plug is detachable to said fitment.

7. The device as set forth in claim 5, wherein said fitment is molded to give a first section for welding connection with said reservoir and a second section for welding connection with said plug, wherein said first and second sections are molded from different plastic materials so as to be compatible respectively with the materials forming said reservoir and said plug.

8. The device as set forth in claim 5, wherein said plug is molded to give a section for welding connection with said fitment, said section being compatible with said fitment.

9. The device as set forth in claim 5, wherein said fitment and said plug are integrally molded to give a section for welding connection with said reservoir, said section being compatible with said reservoir.

10. The device as set forth in claim 1, wherein said reservoir is shaped to have a planar configuration of a general segment of circle defined between a chord and a circumference of an approximate circle which is greater than a circumference of a semicircle, said mouth being disposed at a center of said chord.

11. The device as set forth in claim 5, wherein

said fitment is provided with a valve and is cooperative therewith to establish a feed passage from said reservoir to said plug for feeding said liquid composition from within said reservoir to said dispensing unit,
said valve configured to open and close said feed passage for regulating a supply of said liquid composition.

12. The device as set forth in claim 11, wherein
said fitment is configured to move relative to said plug between an interim position in which said valve is kept closed and a ready-to-use position in which said valve is actuated by said plug to open.

13. The device as set forth in claim 12, wherein
said fitment has a first catch which comes into a latching engagement with said dispensing unit in said interim position, and a second catch which comes into a latching engagement with said dispensing unit in said ready-to-use position.

14. The device as set forth in claim 11, wherein
said fitment has a barrel for detachably receiving therein said plug, said barrel having an open end at which said plug communicates with said feed passage and which is surrounded by a rim,
said valve having an elastically deformable valve membrane which is normally pressed held against said rim to seal said open end

said valve membrane having a plurality of vents which are formed in a portion corresponding outwardly of said rim so as to be normally isolated from said plug by said rim,

said valve membrane being elastically deformed, in response to being pressed by said plug, to give a clearance between the valve membrane and the rim, thereby opening said feed passage for allowing the supply of the liquid composition from within the reservoir to the plug through the vents and the clearance.

15. The device as set forth in claim 14, wherein
said barrel is formed with a recessed bevel which is located at a portion outwardly of said rim and is covered by said valve membrane,
said vents being formed in correspondence with said recessed bevel.

16. The device as set forth in claim 15, wherein
said valve membrane is formed with four said vents which are evenly spaced circumferentially,
said valve membrane being formed on its interior with a cross-shaped projection which is pressed by said plug to deform said valve membrane for opening said feed passage in said ready-to-use position,
said cross-shaped projection having individual arms which are staggered with respect to said vents.

17. The device as set forth in claim 16, wherein said plug is formed at its lower end with slits which are staggered with respect to the individual arms of said cross-shaped projection and are aligned with said vents.